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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,695	04/13/2004	Hajime Kiyokawa	53643-016	2915

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EXAMINER	
BAREFORD, KATHERINE A	
ART UNIT	PAPER NUMBER
1762	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/822,695	KIYOKAWA ET AL.	
	Examiner	Art Unit	
	Katherine A. Bareford	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Claim 6 is canceled

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The response of April 19, 2007 has been received and considered. As the claims have not been amended since the amendment of December 1, 2006, claim 6 remains canceled and claims 1-5 remain pending for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beane et al (US 5453293) in view of Boecker et al (US 5624479) and Wilks et al (US 3926570).

Beane teaches a method of making conductive coated particles. Column 4, lines 25-55. An electroless plating bath is provided containing a reducing agent, metal ions for coating the particles (such as copper ions) and a catalyst for accelerating the electroless reaction. Column 8, lines 30-65. The catalyst can be palladium. Column 8, lines 50-55. The bath is further provided with the particles to be coated, which can be inorganic material, such as silicon carbide. Column 8, lines 30-65. The electroless plating process would provide simultaneously applying an electroless plating to the surface and allowing the palladium catalyst to be carried to the surface of the particles (as the palladium would be in the bath and contact the particles also in the bath) to give conductive particles having an electroless plate coating. Column 8, lines 30-65. The electroless plate coating can comprise copper. Column 4,lines 25-55 and column 8, lines 30-65.

Claim 4: the particles to be coated can also be tungsten or molybdenum. Column 10, lines 50-60.

Beane teaches all the features of these claims except that (1) the palladium catalyst is formed from a solution of palladium chloride and hydrochloric acid added to the bath while stirring the bath, (2) the order of adding ingredients to the bath (that is, that palladium chloride/hydrochloric acid solution is added to a bath already containing reducing agent and particles to be plated), (3) the palladium chloride

concentration in the solution (claim 2), (4) the resulting porous coating (claim 3), (5) and the specific inorganic material of the particles (claim 5).

However, Boecker teaches a process for electroless coating of copper or nickel. Column 2, lines 25-40. Boecker teaches that conventional catalyst agents for such a process include palladium chloride provided in a solution with hydrochloric acid, where the palladium chloride concentration can be 0.01 to 1 percent. Column 3, line 60 through column 4, line 5.

Wilks teaches that conductive particles can be formed by coating particle substrates by electroless plating with materials such as copper or nickel. Column 1, lines 1-15 and column 3, lines 20-50. The particles can be materials such as alumina (aluminum oxide). Column 3, lines 35-40. Wilks teaches that for plating, the electroless bath containing a reductant, metal ions (copper sulfate), etc. is subjected to constant stirring in order to insure a uniform exposure of all the particles to the plating solution. Column 3, lines 60-68.

It would have been obvious to one of ordinary skill in the art a the time the invention was made to modify Beane to provide that the palladium catalyst to be used in the bath is formed from a solution of palladium chloride and hydrochloric acid as suggested by Boecker with an expectation of a desirably catalyzed bath and coating because Beane teaches to use a palladium catalyst in an electroless bath, and Boecker teaches a conventional make up of a palladium catalyst material for electroless plating. It further would have been obvious to modify Beane in view of Boecker to have added

the palladium chloride/hydrochloric acid solution to a bath already containing reducing agent and particles to be plated, while stirring the bath as suggested by Wilks with an expectation of desirable exposure of the particles to be plated to the coating bath, because Beane in view of Boecker teaches electroless plating of particles in a bath, and Wilks teaches that the substrate particles in the bath should be subject to constant stirring to ensure a uniform exposure of the particles to be plated to the plating solution, and as to the exact order of adding the solution to the bath, as discussed in MPEP 2144.04.IV.C, selection of any order of mixing ingredients is prima facie obvious (In re Gibson, 39 F.2d 975, 5 USPQ 230 (CCPA 1930)). As to the palladium chloride concentration in the solution, it would have been obvious to one of ordinary skill in the art to optimize from the range given by Boecker, as "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976)" (see MPEP 2144.05). As to the porosity of the resulting coating formed by the process suggested by the combination of Beane in view of Boecker and Wilks, while the references do not mention the resulting porosity, since all the claimed process steps are followed, it would be an inherent result that the coated particles would have the claimed porosity. As to the plating of the inorganic material such as aluminum oxide, it would have been obvious to modify Beane in view of Boecker and Wilks to coat aluminum oxide particles as suggested by Wilks in order to provide a desirable coated article, as Wilks teaches the desire to coat aluminum oxide particles with electroless coatings of copper or nickel.

5. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pearlstein et al (US 3754939) in view of Wilks et al (US 3926570).

Pearlstein teaches a method of making conductive coated material. Column 1, lines 15-40. An electroless plating bath is provided. Column 2, lines 1-25 and column 3, lines 15-25. The bath is formed using palladium chloride and hydrochloric acid in solution. Column 2, lines 1-25. The bath further contains a reducing agent (hypophosphite) and, metal ions for coating the substrate other than palladium (such as nickel ions). Column 3, lines 15-25. The bath is further provided with the substrate to be coated, which can be inorganic material, such as copper, brass, gold or glass. Column 4, lines 35-65. The electroless plating process would provide simultaneously applying an electroless plating of nickel to the surface of the substrate and allowing the palladium catalyst to be carried to the surface of the substrate (as the palladium is in the form described as a "catalyst" and would be in the bath and contact the substrate also in the bath in provide a further coating) to give conductive materials having an electroless plate coating. Column 5, lines 1-40. The electroless plate coating can comprise nickel or nickel-phosphorous. Column 5 ,lines 1-40 (while the coating also comprises palladium, the claim does not require that the coating consist of Ni or Ni-P).

Claim 2: the palladium chloride concentration can be 2 g/L. Column 3, line 20.

Claim 4: the substrate to be coated can also be copper. Column 4, lines 35-45.

Claim 5: the substrate to be coated can be glass, which would comprise silica (silicon dioxide). Column 4, lines 60-65.

Pearlstein teaches all the features of these claims except that (1) the order of adding ingredients to the bath (that is, that palladium chloride/hydrochloric acid solution is added to a bath already containing reducing agent and particles to be plated) while stirring the bath, (2) that the substrate material is particles, and (3) the resulting porous coating (claim 3).

Wilks teaches that conductive particles can be formed by coating particle substrates by electroless plating with materials such as copper or nickel. Column 1, lines 1-15 and column 3, lines 20-50. The particles can be materials such as alumina (aluminum oxide). Column 3, lines 35-40. Wilks teaches that for plating, the electroless bath containing a reductant, metal ions (copper sulfate), etc. is subjected to constant stirring in order to insure a uniform exposure of all the particles to the plating solution. Column 3, lines 60-68.

It would have been obvious to one of ordinary skill in the art a the time the invention was made to modify Pearlstein to have added the palladium chloride/hydrochloric acid solution to a bath already containing reducing agent and particles to be plated, while stirring the bath as suggested by Wilks with an expectation of desirable exposure of the particles to be plated to the coating bath, because Pearlstein teaches a desirable electroless plating method for plating inorganic articles of various materials, and Wilks teaches that the it is desirable to electrolessly coat inorganic

particles, and that the substrate particles in the bath should be subject to constant stirring to ensure a uniform exposure of the particles to be plated to the plating solution, and as to the exact order of adding the solution to the bath, as discussed in MPEP 2144.04.IV.C, selection of any order of mixing ingredients is prima facie obvious (In re Gibson, 39 F.2d 975, 5 USPQ 230 (CCPA 1930)). As to the porosity of the resulting coating formed by the process suggested by the combination of Pearlstein in view of Wilks, while the references do not mention the resulting porosity, since all the claimed process steps are followed, it would be an inherent result that the coated particles would have the claimed porosity.

Response to Arguments

6. Applicant's arguments filed April 19, 2007 have been fully considered but they are not persuasive.

As to both pending 35 USC 103 rejections, applicant takes the position that none of the cited prior art teach the claimed order of adding the ingredients, and the Examiner has provided that the cited references, when combined together, teach each of the components of the present invention, and although none of the references teach the order of adding ingredients to the bath, In Re Gibson is cited to show that selection of any order of mixing ingredients is prima facie obvious. Applicant argues (1) that this argument is without merit, because based on the invention as described at pages 5-6 and 9 of the specification indicates that the order of addition plays a crucial role in the

formation of the particles of the present invention, which are designed with pores to allow water and ions to pass through. In contrast, applicant argues, the cited prior art achieves a uniform coating of metal on the particles, as shown by Figures 11 and 12 of Beane, with Boecker also providing uniform coating. As well, applicant argues, as Pearlstein teaches a method similar to Beane, it follows that Pearlstein would result in similar uniform coatings as well. Applicant further argues (2) that Wilks, cited for the constant stirring, describes a method of using tin similar to the comparison example of the present invention (pages 11-12 of the present specification). As well, applicant argues Wilks does not disclose the application of the coating simultaneously upon additions of the palladium chloride/HCl solution to the electroless plating bath. Applicat further argues (3) that the dependent claims are allowable for the reasons the independent claim is allowable, and furthermore, as to the claimed porosity of claim 3, applicant argues that the prior art references disclose the opposite of the claimed porosity (a uniform coating).

The Examiner has reviewed applicant's arguments, however, the rejection is maintained. (1) As to the order of adding ingredients to the bath, the Examiner has noted in both rejections above that the references provide the suggestion of providing all the claimed materials in a single bath to be used for electroless deposition without the need for a multistep tin chloride/palladium chloride pretreatment. The Examiner has cited MPEP 2144.04.IV.C, as noting that selection of any order of mixing ingredients

is prima facie obvious as per In re Gibson. The Examiner notes that MPEP 2144.04.IV.C notes that:

"See also In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); In re Gibson, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is prima facie obvious.)"

Applicant has made no showing of new or unexpected results that would negate the use of the above cited art. Applicant has referred to pages 5-6 and 9 of the specification as showing the crucial role that the order of adding the ingredients plays. However, the Examiner has reviewed the specification, however, there is no indication or comparison as to the order of adding ingredients. The invention is compared to "a conventional method" (see page 9, 3rd full paragraph "This slightly reduces the number of active sites as nucleuses compared to a conventional method"). The conventional method described at pages 1-2 involve using tin chloride and palladium chloride pretreatment steps (repeatedly) before electroless plating. A similar method is described at pages 11-12 in the comparative example. There is no comparison between different orders of adding ingredients when a single all in one bath is to be used without the multistep pretreatment described by applicant (or Beane or Pearlstein) is used. Therefore, no showing of criticality of order of adding ingredients has been shown. Furthermore, while Beane describes a uniform coating, (a) applicant does not actually claim a non-uniform coating, and (b) as to the "uniform" coating being porous, this is entirely

possible, with the porosity simply being applied in a uniform pattern with the metal. In fact, Beane suggests that the coating would be porous, because it is indicated that the coated particles 22 would need to be compacted to have "full density" or "non-interconnected" porosity. Column 11, line 65 through column 12, line 5, which indicates that the particles with applied coating would have interconnected porosity before compacting. As well, while Boecker refers to uniform plating, this is as part of a process with the pretreatment catalyst system followed by electroless plating, which is not the all in one bath of the present invention or the primary references to Beane or Pearlstein. Finally, as to Pearlstein teaching a method similar to Beane, and thus providing a similar uniform coating, the Examiner disagrees that this would be the case. Pearlstein does not teach whether the plating is uniform or not. As well, Pearlstein and Wilks in combination provide a bath of materials overlapping that claimed by applicant, so would equally be expected to act as the presently claimed bath. As discussed above, furthermore, Beane does not require that the coating be non-porous.

Furthermore, (2) as to the use of Wilks, while Wilks does not teach the exact same electroless bath system claimed by applicants, Wilks clearly teaches the desire to subject particles to be plated in an electroless bath to constant stirring in order to insure a uniform exposure of all the particles to the plating solution (column 3, lines 60-68). This is clearly relevant to use with all coating of particles in electroless bath, regardless of further ingredients added, because the desire to expose all of the particles to the plating solution would always be present. The combination of the references provides for the

simultaneous plating and catalyzing of the surface with palladium to the extent required by the claims (see the discussion of Beane and Pearlstein in the rejection above).

Furthermore, (3) as to the dependent claims, as the rejection of claim 1 is maintained as discussed in (1) and (2) above, the rejection of the dependent claims is also maintained. As regards to claim 3, the Examiner notes that as discussed with regard to section (1) above, Beane does not require that the coating be non-porous, and in fact, suggests that the coating is porous, and Pearlstein also makes no requirement that the coating be non-porous.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KATHERINE BAREFORD
PRIMARY EXAMINER